FLOW CONTROL DEVICE

This invention relates to a flow control device for dispensing liquid to a predetermined level in a container.

When filling a container, such as a bucket or watering can, it is common practice to walk away from the container while it is being filled and then to return only to find that the container has overflowed.

The present invention seeks to provide a flow control device that will prevent this happening.

According to the invention there is provided a flow control device for dispensing liquid to a predetermined level in a container, comprising a tubular body having a closed upper end and an open lower end, an inlet attached to or for attachment to a liquid supply, a flap valve which is pivoted within the body below the inlet about an axis extending transversely to the body and which, in the absence of external forces, will adopt an open condition allowing liquid to flow through the body, and a float for pivoting the flap valve towards a closed condition as the liquid level in the container rises.

Preferred and/or optional features of the invention are set forth in claims 2 to 15, inclusive.

The invention will now be more particularly described, by way of example, with reference to the accompanying drawing which is a sectional side view of one embodiment of a flow control device according to the invention.

Referring to the drawing, the flow control device shown therein can be fitted internally in a container (not shown), such as a bucket or watering can, to dispense liquid to a predetermined level in the container.

The fluid control device comprises a tubular body 10 having a closed upper end 11 and an open lower end 12. The body 10 also has a hook 13 for hooking the device to the rim of the container.

The tubular body 10 has a liquid inlet 14 connected to, and extending through, its closed upper end 11. The outer upper end of the inlet 14 has a plurality of annular serrations or other formations 15 by which a liquid feed pipe, such as hose, can be fitted.

The tubular body 10 also has a side discharge opening 16. An inclined wall 17 separates the discharge opening 16 from a float chamber 18.

A flap valve 19 is pivoted within the tubular body 10 intermediate the upper and lower ends 11 and 12, respectively, and above discharge opening 16. The axis 20 of the flap valve 19 is preferably, but not necessarily, offset to one side of a plane 21 bisecting the flap valve 19. A float 22 is provided in the float chamber 18 below the flap valve 19

for pivoting the flap valve towards a closed condition as the liquid level in the container rises. The inclined wall 17 acts as a stop to prevent the flap valve 19 opening too far.

The float 22, as shown, is a two-part float and is exposed to liquid in the container via the open lower end 12 of the body 10.

The flap valve 19 is weighted so as to move towards an open condition as shown in the single Figure in the absence of external forces applied to the flap valve by the float or water pressure above the flap valve.

An annular seal 23 of generally L-shaped cross-section is provided on the flap valve 19 to seal against the internal wall of the body 10 under liquid pressure when the flap valve is in a closed condition.

The lower, inner end of the inlet 14 is shaped to direct liquid fed into the container past the side of the flap valve 19 remote from the flow chamber when the latter is in a fully open condition and to direct the liquid against said one side of the flap valve 19 as the latter starts to close.

A guide 24, typically defining an inverted U-shaped channel, is provided on the internal wall of the body 10 to encourage water dispensed from the inlet to flow past said one side of the flap valve 19 and through the side discharge opening 16 when the flap valve is in an open condition.

If the axis 20 of the flap valve 19 is offset as described above, the axis 20 divides the flap valve 19 into a first portion 19a and a second portion 19b of greater surface area than the portion 19a and the float 22 acts on the under surface of the smaller portion 19b for a reason which will be explained later.

Regions of the body 10 just below the first portion 19a of the flap valve when the flap valve is considered in a closed condition and just above the portion 19b of the flap valve when the flap valve is considered in a closed condition are outwardly contoured as shown in the single drawing to assist with the accurate operation and closing of the flap valve 19 as it is important that the tolerances between the seal 23 and the body 10 are as close as possible to aid effective sealing with minimal liquid pressure. The body is, therefore, outwardly contoured in regions past which the flap valve passes as it approaches its closed condition.

Also, the flap valve 19 ideally has a round pivot rod mounted in apertures in the body 10 which apertures are oval or elongate in a plane normal to the axis of the body to facilitate opening and closing of the flap valve.

The flap valve 19 has a manual externally operable member for pivoting the flap valve 19 between closed and open conditions. As shown, this takes the form of a spring loaded plunger 25. The flow control device is also provided with a pressure release valve located above the flap valve 19 when the latter is in a closed condition. This pressure release valve could be incorporated in the spring loaded plunger 25. The

spring loaded plunger 25 also acts as a stop to ensure the flap valve 19 closes in the correct position.

The flow control device can be made of any suitable material and the tubular body 10 typically has a cross sectional dimension of approximately 4 cm, although it could be smaller or larger.

The body 10 can have any appropriate cross-sectional shape. It does not need to be of circular cross-section.

In use, the device is placed into the container and hooked on the rim of the container. Water or other liquid is fed into the tubular body 10 via a hose attached to the inlet 14. When the liquid in the container is below the float 22, the flap valve 19 pivots to an open condition as shown in the single Figure. As the liquid level in the container rises and makes contact with the float 22, the flap valve pivots towards a closed condition. As the flap valve 19 pivots towards its closed condition, liquid entering the container from the spigot will impinge on the one side of the flap valve 19 causing the flap valve to close rapidly and seal against the internal wall of the body. If the pivot axis is offset from the plane 21 the pressure of liquid above the flap valve 19 will cause the latter to remain tightly closed improving the effectiveness of the seal 23.

In order to release the pressure of liquid above the flap valve 19 and allow the flap valve to return to an open condition, the flap valve may be manually pivoted by the spring loaded plunger 25. Additionally or alternatively the pressure can be released by

opening the pressure release valve. Preferably, in both these cases, the water supply to the inlet 14 should first be turned off to reduce the pressure of inflowing water on the flap valve.

The embodiment described above is given by way of example only and various modifications will be apparent to persons skilled in the art without departing from the scope of the invention as defined by the appended claims. For example, the hook could be replaced by any other appropriate attachment device. The float could be provided as an integral part of the flap valve. In this case, there may be no need for the side discharge opening and liquid could be discharged through the open lower end of the tubular body. The flow control device could be used for applications other than those mentioned. For example it could be used in toilet cisterns and cold water tanks or it could form an integral part of a tap for filling, *inter alia*, basins or baths.